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Laterality in Termite-Fishing by Fongoli Chimpanzees: Preliminary Report

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INTRODUCTION

Many studies in both free-ranging and captive apes have shown that some forms of laterality of hand function occur in non-human primates[1]. However, true handedness (*sensu* McGrew and Marchant[2]), when most individuals

show a skew in hand preference in the same direction across different tasks, seems to be restricted to humans. Other hominoids appear unlateralized in simpler tasks, such as reaching, picking up objects, and grooming[3], but they show hand preference for more complex tasks, such as tool-using[2, 4, 5] or elaborate food processing[6, 7].

Laterality in termite-fishing[8] has been studied only at Gombe, and the two published data-sets are congruent. McGrew and Marchant[2, 9] reported that most (27 of 36) chimpanzees showed an individualized hand preference for right or left, as did Lonsdorf and Hopkins[10] (16 of 17) for termite-fishing in the same community. No other data have been published for chimpanzee communities elsewhere. This study asks if termite-fishing by Fongoli chimpanzees is lateralized, shows hand preference (individuals are lateralized, but with no populational preference for either hand), or task specialization (all or most individuals use the same hand).

METHODS

Fongoli, in southeastern Senegal, is a mosaic savanna, and the only hot, dry and open study site with habituated chimpanzees (see Pruetz, 2006[11], for a description of the habitat and the diet of Fongoli chimpanzees). The only published study of termite-fishing at Fongoli is based on indirect data[12] (Bogart and Pruetz, in prep.).

PB collected these data in April and May 2005, after habituation of the first males of the Fongoli community. The chimpanzees were observed for 543 hours over 50 days, when termites were a major food source. PB collected data using scan sampling with a focal subject target on the subject's activity and on the other individuals in sight, by instantaneous recording every 5 minutes[13].

A session of termite-fishing was a continuous period during which the individual ate termites. Sessions are separated by other activities (e.g. rest, groom, etc). During a session, change of posture or position and change of tool occurred: thus a session contained several bouts (*sensu* McGrew and Marchant[2]). The data-points taken in each session by instantaneous sampling cannot be considered independent observations, so statistical analysis was done only on individual sessions, which do not equal events [2]. Laterality was tested with the binomial test for each individual who attained at least 6 sessions. All tests are two-tailed, with alpha set at 0.05 (A further 10 chimpanzees showed termite-fishing but did not reach this criterion, which is the minimum number necessary to show a statistic significance).

PB recorded which hand inserted and extracted the tool into and from the hole in the termite mound for each insertion event.

RESULTS

Table 1 shows the data for 47 sessions of termite-fishing shown by 5 males. Each session averaged 9.1 data-points (range per individual: 7.3-10.6) and lasted an average of 45 minutes. Two individuals, BN and KL, were exclusively lateralized to the left and right respectively; YO was significantly right lateralized, and MM and SI were right-biased and left-biased respectively, but not significantly so. Although the sample is very small, no skew emerges in the direction of hand preference among these subjects. The results for instantaneous samples reflect those for sessions.

Table 1. Frequency of lateralized (L vs. R) termite-fishing by sessions and instantaneous samples.

Subject	Obs	LH sessions	RH sessions	LH inst. samples	RH inst. samples	p-value	Hand preference
BN	6	6	0	41	0	0.032	L
KL	8	0	8	0	74	0.008	R
MM	16	4	12	27	130	0.076	(R)
SI	8	7	1	56	25	0.07	(L)
YO	9	1	8	14	52	0.04	R
Total	47	18	29	138	281	-	-

DISCUSSION

Termite-fishing at Fongoli appears to be an individually lateralized task, in which some of the individuals specialize in using one hand, and some use the other, but none is ambilateral. These results agree with studies of Gombe chimpanzees[3, 9, 10], despite the sites being separated by thousands of kilometers on opposite sides of Africa. Extending data collection to the rest of the Fongoli community is needed to validate these preliminary findings.

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